NOTES ON THE ORNITHOLOGY OF CLAY AND PALO ALTO COUNTIES, IOWA.

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Plates XI–XII.

THE following paper is based upon material secured by the University of Michigan-Walker Expedition to northwestern Iowa in the summer of 1907. The field notes are those of Alexander G. Ruthven, who has also supplied the general summary of the habitat

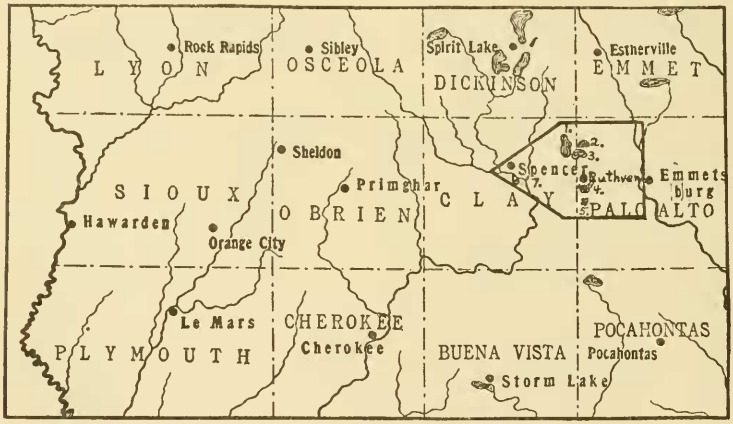

Fig. 1. Map showing area covered by survey.

distribution and has assisted in the preparation of the paper. The field work was done by Drs. Ruthven and Max M. Peet, and covered the period between July 1 and September 1. Three papers [2] have appeared on the results of this work.

[1] Museum of Zoology, University of Michigan.

[2] Ruthven, Alexander G., The Faunal Affinities of the Prairie Region of Central North America. Amer. Nat., XLII, pp. 388–393. Contributions to the Herpetology of Iowa. Proc. Iowa Acad. Sci., 1910, pp. 198–209. Ruthven, Alexander G., and Wood, Norman A., Notes on a Collection of Mammals from Northwestern Iowa, *ibid.*, 1912, pp. 203–205.

The investigations were confined to the townships of Sioux, Riverton, Lake, Freeman and Logan in Clay County and Highland and Lost Island in Palo Alto County. These townships are in the adjacent parts of the two counties (Fig. 1). 334 skins, 12 nests and 8 sets of eggs, representing 86 species were secured, to which have been added by purchase seven specimens, representing five species. Most of the stomachs were preserved for future study.

HABITATS.

A description of the region has been given by Ruthven,[1] and it will be sufficient to quote the following general account of the habitats. "Owing to the relief there is more diversity in the biotic environments of the region investigated than is usual in the prairie-plains region. The ridges and knobs, varying in height, are separated by small areas of flat or gently rolling prairie, and everywhere are lakes, ponds and sloughs of various sizes. The immediate area studied was on the water-shed between the Missouri and Mississippi river systems, the lakes examined being the source of streams tributary to the different systems."

Ruthven has classified the different habitats as follows:

UPLAND.

Upland Prairie. Uncultivated areas, covered by the original vegetation of grasses and herbs, are still to be found on some of the ridges. These areas are, however, becoming fewer in number yearly, as more land is placed under cultivation. (Plate XI, Fig. 1.)

Grain Fields. The greater part of the higher land has, within the past thirty years, been placed under cultivation, and this has been mostly at the expense of the upland prairie areas.

Groves. In many places groves of soft maple, cottonwood, wil-

[1] Ruthven, Alexander G., Contributions to the Herpetology of Iowa, p. 200.

low, and box-elder have been planted on the uplands. These are so open, however, as to have no appreciable effect on the terrestrial vertebrate fauna, with the exception of the birds, the local distribution of which they are profoundly modifying.

LOWLAND.

Lowland Prairie (Meadows). The low, generally poorly drained, areas have in many instances been reserved for hay-land or pasture. In some places the original vegetation has been supplanted by tame grasses; in other places it remains undisturbed. The original vegetation consists of a dense growth of tall grasses and herbaceous forms. (Plate XI, Fig. 2.)

Swamps (Sloughs). The swamps are mostly devoid of trees and filled with a rank growth of grasses and sedges. The vegetation grows principally in clumps and on hummocks composed of roots and decaying vegetation. They are mostly uninfluenced by man, except as they are drained.

Shores of Lakes and Streams (Marginal Forests). This habitat supports the only natural timber in the region, and, where undisturbed, there is always a comparatively dense growth along the shores of the streams and larger lakes. The timber zones are, however, much narrower, and the trees more scrubby, than in the southern parts of the state. In most places at the present time this timber has been largely removed. (Plate XII, Fig. 1.)

AQUATIC.

The aquatic life is found in the lakes, ponds, sloughs and streams. The conditions in these habitats are very similar, as the lakes are for the most part shallow and the streams slow-flowing. (Plate XII, Fig. 2.)

1. UPLAND PRAIRIE, CLAY COUNTY, IOWA.
2. LOW MEADOW, CLAY COUNTY, IOWA.

LOCAL DISTRIBUTION OF BIRDS.

As was to be expected the birds may be divided rather sharply into five groups — woodland, prairie, meadow, aquatic (including waders), and marsh forms. There is some overlapping because some of the prairie forms will nest in the groves, some of the marsh forms feed on the prairie, and some of the woodland forms nest on fence posts, telegraph poles, etc., on the prairie and may feed there, but the five groups are nevertheless rather well defined. The more common species and the major habitats which they frequent are as follows:

Woodlands (Starred species only observed as migrants): Mourning Dove, Flicker, Kingbird, Phœbe, Robin, Bluebird, Bob-white, Long-eared Owl, Screech Owl, Black-billed Cuckoo, Yellow-billed Cuckoo (marginal forests only), Downy Woodpecker, Red-headed Woodpecker, Least Flycatcher, Alder Flycatcher, Blue Jay (marginal forests only), Orchard Oriole, Baltimore Oriole, Bronzed Grackle, Goldfinch, Rose-breasted Grosbeak, Warbling Vireo, Black and white Warbler*, Yellow Warbler, Wilson's Warbler,* Catbird, Brown Thrasher, Parkman's Wren, Long-tailed Chickadee, Bay-breasted Warbler*, Song Sparrow, Cowbird.

Prairies: Prairie Chicken, Upland Plover, Flicker, Nighthawk, Arkansas Kingbird, Prairie Horned Lark, Dickcissel, Western Grasshopper Sparrow, Migrant Shrike, Bluebird, Short-eared Owl, Kingbird, Tree Swallow.

Meadows: Bobolink, Dickcissel, Marsh Hawk, Short-eared Owl, American Bittern, Meadowlark.

Swamps: Black Tern, American Bittern, Least Bittern, King Rail, Virginia Rail, Sora Rail, Yellow-headed Blackbird, Red-winged Blackbird, Swamp Sparrow, Maryland Yellow-throat, Prairie Marsh Wren, Short-billed Marsh Wren.

Aquatic Habitats and Beaches (Starred species only observed as migrants): Semipalmated Plover*, Stilt Sandpiper*, Pectoral Sandpiper*, Least Sandpiper*, Solitary Sandpiper*, Spotted Sandpiper, Yellowlegs*, Greater Yellowlegs*, Killdeer, Pied-billed Grebe, Blue-winged Teal, Shoveller, Great Blue Heron, Green Heron, Florida Gallinule, Coot, Kingfisher.

It will be noted that no division into grove and natural woodland forms is attempted in the above grouping, and an inspection of the data given in the list of species will show that this is because no differences in the faunas of the two habitats are apparent. The groves (which have in every instance been planted) are profoundly influencing the local distribution of the woodland forms. Formerly the only trees in the region were about the lakes and streams, but the narrow zones of original woodland are rapidly being cleared, which would probably eliminate a number of species if it were not for the fact that the groves and the trees that have been planted along the roads serve as refuges. As it is, there is apparently a congestion of the woodland species. In one grove about one hundred yards square, grouped about farm buildings, and composed of low box elders and willows and well cleared of underbrush, sixteen species of birds were found nesting and a number of these were represented by several pairs. It is evident that the low trees, lack of underbrush, and the location of this grove must have constituted unfavorable conditions for nesting birds, and to these was added the presence of scores of English Sparrows which also nested in the trees. A more careful study would probably show further that many of the woodland species are forced to the prairie for food: that some of them are also forced to breed on the prairie is apparently shown by the nesting of the Flicker, Tree Swallow, Kingbird and Bluebird on the fence posts.

LIST OF SPECIES.[1]

1. **Podilymbus podiceps.** PIED-BILLED GREBE.— Only a few birds of this species were seen. An adult male was taken, July 29, in the rushes of the east end of Elbow Lake, and on July 16 a nest with six eggs was found in the same habitat.

2. **Hydrochelidon nigra surinamensis.** BLACK TERN.— The Black Tern was found in numbers. It nested in the wet marshes that form the outlet to Lost Island Lake, and roamed over all of the grassland habitats. Immature birds just able to fly were taken on and after July 3.

[1] As the field work covered a restricted area (Fig. 1) exact localities have often been omitted in the annotations in the following list, the habitat data being deemed sufficient. The dates of observations are also omitted, except in the case of migrants and immature birds, nests and eggs.

1. SHORE OF TRUMBULL LAKE, CLAY COUNTY, IOWA.
2. EAST END OF ELBOW LAKE, PALO ALTO COUNTY, IOWA.

3. **Querquedula discors.** BLUE-WINGED TEAL.— This was the most common duck observed. Nests and eggs (11 in one nest) as well as young birds in all stages of development were found in the outlets of Elbow and Lost Island Lakes. Most of the young were well feathered and able to fly on July 16.

4. **Spatula clypeata.** SHOVELLER.— A single specimen, an adult female, secured in the outlet of Lost Island Lake, August 21, was the only one of this species observed.

5. **Botaurus lentiginosus.** BITTERN.— Very common about the marshes of the region. The nests were found most frequently in the low meadows bordering the marshes.

6. **Ixobrychus exilis.** LEAST BITTERN.— The Least Bittern was quite common at the east end of Elbow Lake, where a number of pairs nested among the rushes growing in water from three to four feet deep. An adult male and female with nest and six eggs (slightly incubated) were taken here on July 16, and on July 30 six nestlings and another nest with five eggs nearly ready to hatch were found in the same habitat.

7. **Ardea herodias herodias.** GREAT BLUE HERON.— A relatively common species about the lakes and marshes of the region. On August 15, an adult female was taken at Virgin Lake, and on August 22 an adult male was secured at Elbow Lake.

8. **Butorides virescens virescens.** GREEN HERON.— Occasionally noted about the marshes but not as common as the preceding species. An immature male with down-tipped feathers on the head was taken at Elk Lake on August 19, and on August 9 an adult female was secured at Trumbull Lake. The species was also observed in the outlet of Elbow Lake.

9. **Nycticorax nycticorax nævius.** BLACK-CROWNED NIGHT HERON. — On August 21 an immature male was taken by Ruthven in a clump of willows along a road and about a half mile from the outlet of Elbow Lake. This was the only individual of the species that was certainly identified. The bird had become exhausted, and was evidently forced to alight outside of its regular habitat.

10. **Rallus elegans.** KING RAIL.— There is an adult male of this species, taken near Ruthven, October 4, 1909, by Nels Hansen, in the museum collection.

11. **Rallus virginianus.** VIRGINIA RAIL.— Undoubtedly this species is rather common about the marshes of the region studied, although it was only noted occasionally. Three specimens were taken: one, an immature male well feathered, was secured in a slough on the south side of Elbow Lake on August 3.

12. **Porzana carolina.** SORA.— The only Sora seen was an adult male taken at the outlet of Lost Island Lake, August 8.

13. **Gallinula galeata.** FLORIDA GALLINULE.— Very common about the marshes of the region explored. Several nests with eggs and numbers of immature birds were noted in the rushes and sedges. On August 2,

an adult male and female with a nest and seven eggs were found at the east end of Elbow Lake, and well feathered birds were secured at the outlet of Elbow Lake, August 19 and 21, in a pond near Elbow Lake, on August 21, and at the outlet of Lost Island Lake, on August 30.

14. **Fulica americana.** COOT.— A common breeding species about all of the lakes and marshes in the region. Immature birds were taken at the east end of Elbow Lake on July 16 and 29, and at the outlet of Lost Island Lake on August 6, 12 and 14. Some of the young taken on July 16 and August 14 were still in the down.

15. **Micropalama himantopus.** STILT SANDPIPER.— Two adult males of this sandpiper were taken on a pond near Virgin Lake, August 15, and on August 27 an adult female was secured at a pond in Clay County. These were the only birds seen.

16. **Pisobia maculata.** PECTORAL SANDPIPER.— The only Pectoral Sandpipers seen were in small flocks from which the following specimens were taken; an adult male and female in a swampy meadow near the outlet of Lost Island Lake, August 8, an adult female near Virgin Lake, August 15, and an adult male near a pond in Clay County, August 11.

17. **Pisobia minutilla.** LEAST SANDPIPER.— Rather common about the ponds after August 11. Only adult males were secured, five at a pond in Clay County, August 11, 19 and 21, and one near Virgin Lake, August 15.

18. **Totanus melanoleucus.** GREATER YELLOW-LEGS.— An adult female of this species was taken near a pond in Clay County, August 15. This was the only bird seen.

19. **Totanus flavipes.** YELLOW-LEGS.— The only Yellow-legs observed were in several small flocks from which an adult male was taken in a marsh, August 12, an adult female at a small pond near Virgin Lake, on August 15, and an adult male at a pond in Clay County, August 22.

20. **Helodromas solitarius solitarius.** SOLITARY SANDPIPER.— A common species during the fall migrations. Only adults were seen, and the first bird was observed on July 31. After this date and throughout August they were found about the prairie ponds, on the mud flats in the sloughs, and on the lakes.

21. **Bartramia longicauda.** UPLAND PLOVER.— Not uncommon on the higher grassland areas. Immature birds (males) were found in a pasture south of Elbow Lake and on grass-covered hills in eastern Clay County on August 3 and 19. These birds were well feathered.

22. **Actitis macularia.** SPOTTED SANDPIPER.— Common in the breeding season about the lakes with sandy shores. On August 22 they were observed about the ponds on the prairie.

23. **Oxyechus vociferus.** KILLDEER.— Very common throughout the region studied; preferring the vicinity of water but often found at some distance from it. Immature specimens were secured in a slough south of Elbow Lake, August 2, in a pasture in eastern Clay County, August 8,

and at a pond in Clay County, August 12 and 29. These birds are well feathered but have down-tipped tail feathers.

24. **Ægialitis semipalmata.** SEMIPALMATED PLOVER.— The only record of this species secured was an adult male taken at a pond in Clay County, September 1.

25. **Colinus virginianus virginianus.** BOB-WHITE.— This bird is not uncommon throughout the region examined. It was most frequently observed about the wooded areas.

26. **Tympanuchus americanus americanus.** PRAIRIE CHICKEN.— Formerly this species was very common in Clay and Palo Alto Counties, according to the observations of Ruthven, but in recent years it has been nearly exterminated. It was not found in the summer of 1907, but on November 11, 1911, Nels Hansen took an adult female, near Ruthven, that is now in the museum.

27. **Zenaidura macroura carolinensis.** MOURNING DOVE.— Very common throughout the region. The nests are placed in the wooded areas and in the willows along the roads. Two nestlings were taken in a willow tree on July 2 (hatched July 1). Another was taken in a grove, July 12, and a nest with two eggs was found, August 15, in the woods at Virgin Lake.

28. **Circus hudsonius.** MARSH HAWK.— Common throughout the region, frequenting and nesting in the low meadows. An immature male was taken near the outlet of Elbow Lake, August 28.

29. **Haliæetus leucocephalus leucocephalus.** BALD EAGLE.— The species was not found in the summer of 1907, but an immature female taken in Palo Alto County, October, 1907, by Nels Hansen, is in the museum.

30. **Asio wilsonianus.** LONG-EARED OWL.— An adult female was found in a grove near Lost Island Lake, July 22.

31. **Asio flammeus.** SHORT-EARED OWL.— An adult female Short-eared Owl was taken on upland prairie in eastern Clay County, August 5.

32. **Otus asio asio.** SCREECH OWL.— This species was not found in 1907. An adult male, taken February 1, 1909, and an adult female, secured on February 2, 1909, in Palo Alto County, by Nels Hansen, are in the museum.

33. **Nyctea nyctea.** SNOWY OWL.— Occasionally seen in the winter (Ruthven).

34. **Coccyzus americanus americanus.** YELLOW-BILLED CUCKOO. — Not uncommon in the wooded areas. One specimen, an adult female, was taken in a grove of willows near Elbow Lake, July 17, another at Elk Lake, August 21, and a third in a grove on high ground, August 28.

35. **Coccyzus erythrophthalmus.** BLACK-BILLED CUCKOO.— Occasionally noted in the groves and timber zones along the streams and lakes. An adult male and female were found in a grove near Lost Island Lake, July 22, and others were seen in a grove on high ground at different times during July and August.